

Amendments to the Specification

Please insert the following new paragraphs at page 3, line 20 (immediately after the paragraph ending with the words "are described herein"):

A method for use in the fabrication of integrated circuits according to the present invention includes providing a substrate assembly having a surface. A diffusion barrier layer is formed over at least a portion of the surface. The diffusion barrier layer is formed of RuSi_x , where x is in the range of about 0.01 to about 10.

In one embodiment of the method, the diffusion barrier layer is formed of RuSi_x , where x is in the range of about 1 to about 3, more preferably about 2.

In another embodiment of the method, the barrier layer is formed by depositing RuSi_x by chemical vapor deposition. In an alternative embodiment, the barrier layer is formed by forming a layer of ruthenium relative to a silicon containing region and performing an anneal to form RuSi_x from the layer of ruthenium and the silicon containing region.

A method for use in the formation of a capacitor according to the present invention includes forming a first electrode on a portion of a substrate assembly. A high dielectric material is formed over at least a portion of the first electrode and a second electrode is formed over the high dielectric material. At least one of the first and second electrodes includes a barrier layer formed of RuSi_x , where x is in the range of about 0.01 to about 10.

Another method according to the present invention for use in the formation of a capacitor includes providing a silicon containing region of a substrate assembly. A first electrode is formed on at least a portion of the silicon containing region of the substrate assembly. The first electrode includes a barrier layer of RuSi_x , where x is in the range of about 0.01 to about 10. A high dielectric material is formed over at least a portion of the first electrode and a second electrode is provided over the high dielectric material.

In one embodiment of the method, the formation of the barrier layer includes forming a layer of ruthenium on at least a portion of the silicon containing region. Thereafter, the layer of ruthenium formed on the at least a portion of the silicon containing region is annealed resulting in the RuSi_x barrier layer. The layer of ruthenium may be deposited by chemical vapor deposition with a thickness of about 10Å to about 300Å.

In another embodiment of the method, one or more conductive layers are formed

relative to the RuSi_x barrier layer. The one or more conductive layers are formed of at least one of a metal or a conductive metal oxide, e.g., formed from materials selected from the group of RuO_2 , RhO_2 , MoO_2 , IrO_2 , Ru, Rh, Pd, Pt, and Ir.